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Hemostatic resuscitation is neither hemostatic nor resuscitative in trauma hemorrhage.

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BACKGROUND: Trauma hemorrhage continues to carry a high mortality rate despite changes in modern practice. Traditional approaches to the massively bleeding patient have been shown to result in persistent coagulopathy, bleeding, and poor outcomes. Hemostatic (or damage control) resuscitation developed from the discovery of acute traumatic coagulopathy and increased recognition of the negative consequences of dilutional coagulopathy. These strategies concentrate on early delivery of coagulation therapy combined with permissive hypotension. The efficacy of hemostatic resuscitation in correcting coagulopathy and restoring tissue perfusion during acute hemorrhage has not been studied.

METHODS: This is a prospective cohort study of ROTEM and lactate measurements taken from trauma patients recruited to the multicenter Activation of Coagulation and Inflammation in Trauma (ACIT) study. A blood sample is taken on arrival and during the acute bleeding phase after administration of every 4 U of packed red blood cells (PRBCs), up to 12 U. The quantity of blood products administered within each interval is recorded.

RESULTS: Of the 106 study patients receiving at least 4 U of PRBC, 27 received 8 U to 11 U of PRBC and 31 received more than 12 U of PRBC. Average admission lactate was 6.2 mEq/L. Patients with high lactate (≥ 5 mEq/L) on admission did not clear lactate until hemorrhage control was achieved, and no further PRBC units were required. On admission, 43% of the patients were coagulopathic (clot amplitude at 5 minutes ≤ 35 mm). This increased to 49% by PRBC 4; 62% by PRBC 8 and 68% at PRBC 12. The average fresh frozen plasma/PRBC ratio between intervals was 0.5 for 0 U to 4 U of PRBC, 0.9 for 5 U to 8 U of PRBC, 0.7 for 9 U to 12 U of PRBC. There was no improvement in any ROTEM parameter during ongoing bleeding.

CONCLUSION: While hemostatic resuscitation offers several advantages over historical strategies, it still does not achieve correction of hypoperfusion or coagulopathy during the acute phase of trauma hemorrhage. Significant opportunities still exist to improve management and improve outcomes for bleeding trauma patients.

LEVEL OF EVIDENCE: Epidemiologic study, level III.